SARS-CoV-2 viral load data

PLOS BIOLOGY

Viral dynamics of acute SARS-CoV-2 infection and applications to diagnostic and public health strategies

Stephen M. Kissler, Joseph R. Fauver, Christina Mack, Scott W. Olesen, Caroline Tai, Kristin Y. Shiue, Chaney C. Kalinich, Sarah Jednak, Isabel M. Ott, Chantal B. F. Vogels, Jay Wohlgemuth, James Weisberger, John DiFiori, [...], Yonatan H. Grad [view all]

The NEW ENGLAND JOURNAL of MEDICINE

Viral Dynamics of SARS-CoV-2 Variants in Vaccinated and Unvaccinated Persons

Stephen M. Kissler, Ph.D., Joseph R. Fauver, Ph.D., Christina Mack, Ph.D., Caroline G. Tai, Ph.D., Mallery I. Breban, Ph.D., Anne E. Watkins, Ph.D., Radhika M. Samant, Ph.D., Deverick J. Anderson, M.D., M.P.H., Jessica Metti, Ph.D., Gaurav Khullar, M.D., Rachel Baits, Ph.D., Matthew MacKay, Ph.D., Daisy Salgado, Ph.D., Tim Baker, Ph.D., Joel T. Dudley, Ph.D., Christopher E. Mason, Ph.D., David D. Ho, M.D., Nathan D. Grubaugh, Ph.D., Yonatan H. Grad, M.D., Ph.D.

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The impact of immune history and variant on SARS-CoV-2 viral kinetics and infection rebound

James A. Hay, Stephen M. Kissler, Joseph R. Fauver, Christina Mack, Caroline G. Tai, Radhika M. Samant, Sarah Connolly, Deverick J. Anderson, Gaurav Khullar, Matthew MacKay, Miral Patel, Shannan Kelly, April Manhertz, Isaac Eiter, Daisy Salgado, Tim Baker, Ben Howard, Joel T. Dudley, Christopher E. Mason, Manoj Nair, Yaoxing Huang, David D. Ho, Nathan D. Grubaugh, Yonatan H. Grad

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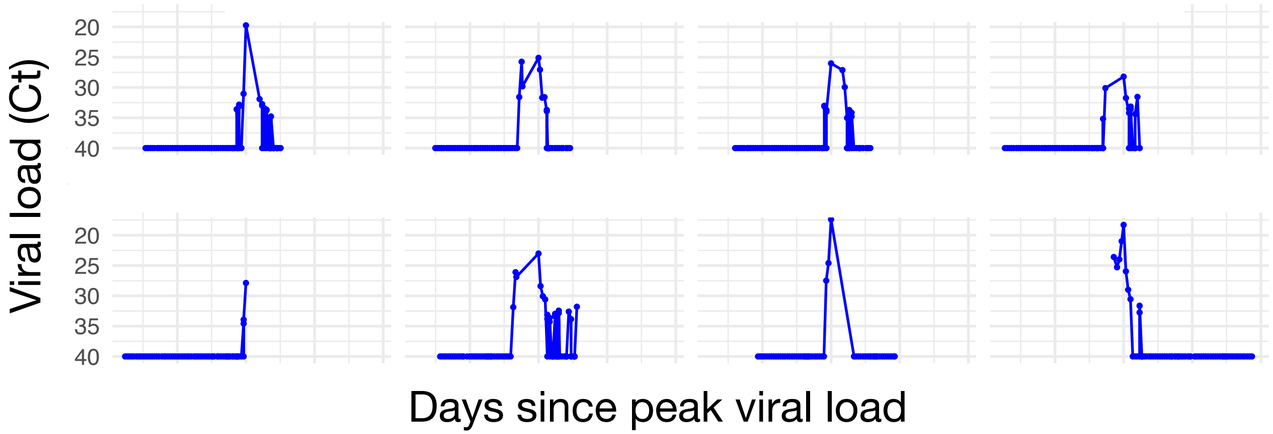
- Frequent (~daily), prospective (not triggered by symptoms) combined anterior nasal and oropharyngeal swabs
- Participants in the NBA occupational health program: players, staff, vendors, and family members
- Ct values measured by Roche cobas Target 1
- Conversion from Ct to log10 RNA copies/ml calculated using a standard curve
- Samples sequenced by colleagues at Tempus; analysis led by Joseph Fauver and Nathan Grubaugh



A model for SARS-CoV-2 viral kinetics

$$\frac{dT}{dt} = -\beta VT - \Phi IT + \rho R$$

$$\frac{dR}{dt} = \Phi IT - \rho R$$

$$\frac{dE}{dt} = \beta VT - kE$$

$$\frac{dI}{dt} = kE - \delta I$$

$$\frac{dV}{dt} = \pi I - cV,$$

Ke *et al.* (2021), PNAS